

CLAIMS

We claim:

- 1 1. A method of wireless connectivity comprising:
2 broadcasting a beacon by a server; and
3 receiving and storing the beacon at the client, the client further retaining
4 information indicative of a path to the server; and
5 rebroadcasting the beacon by the client.
- 1 2. The method of claim 1, comprising:
2 storing every beacon received;
3 designating one path identified by one beacon as the optimal path;
4 setting a default gateway as identified in the optimal path; and
5 rebroadcasting only the beacon representing the optimal path.
- 1 3. The method of claim 1, wherein the beacon broadcast by the server
2 includes a hop-count set to zero, the method further comprising:
3 each client that receives the beacon rebroadcasting the beacon with the
4 hop-count incremented by one;
5 such that each client receiving the beacon knows a way to reach the server
6 and the number of hops in this path.
- 1 4. The method of claim 1, wherein the beacon broadcast by the server

2 includes server address, such that each client receiving the beacon knows the
3 address of the server.

1 5. The method of claim 1 further comprising:
2 each client that receives the beacon rebroadcasting the beacon with an
3 address of the client added to the beacon;
4 such that each client receiving the beacon has a complete path to the
5 server.

1 6. The method of claim 1, wherein the beacon includes a sequence
2 number representing a current routing cycle.

1 7. The method of claim 6, further comprising, upon a client receiving
2 a beacon,
3 determining if a beacon has already been received for this routing cycle;
4 and
5 if no beacon has already been received for the routing cycle, storing a
6 routing path to the server from the beacon.

1 8. The method of claim 7, further comprising, if the beacon has
2 already been received for the routing cycle:
3 determining if this beacon has a higher sequence number than a prior
4 beacon for this routing cycle, and if so,

5 storing the current beacon in memory.

1 9. The method of claim 6, further comprising, upon a client receiving
2 a beacon,
3 determining if a currently received beacon represents an optimal path for
4 this routing cycle; and
5 if the current beacon represents the optimal path, identifying a default
6 gateway in the current beacon, and storing the default gateway.

1 10. The method of claim 2, further comprising:
2 determining if there is a previous default gateway identified; and
3 deleting the previous default gateway from memory.

1 11. The method of claim 1, further comprising, for each client:
2 collecting all beacons; and
3 selecting a single beacon to rebroadcast.

1 12. The method of claim 11, wherein selecting a beacon comprises:
2 identifying a number of hops between the server and the client for each
3 beacon; and
4 selecting the beacon with the lowest number of hops.

1 13. The method of claim 11, wherein selecting a beacon comprises:

2 identifying a traffic monitoring code (TMC) for each of the beacons; and
3 selecting the beacon with the lowest TMC.
4

1 14. The method of claim 11, wherein selecting a beacon comprises:
2 identifying a beacon with a highest quality; and
3 selecting the beacon with the highest quality.
4

1 15. The method of claim 14, wherein the highest quality is a best
2 signal-to-noise ratio.
3

1 16. The method of claim 14, wherein the highest quality is based on
2 most back end bandwidth capacity at the server.
3

1 17. The method of claim 14, wherein the highest quality is based on a
2 lowest level of traffic being handled by the server.
3

1 18. The method of claim 1, further comprising:
2 sending a reverse beacon to the server; and
3 constructing a client tree in the server, wherein the server has a path to all
4 clients.

1 19. A server for wireless communications comprising:
2 a beacon logic to generate a beacon and broadcast the beacon; and

3 a wireless transceiver to receive a plurality of reverse beacons, the reverse
4 beacons indicating a path to each of the clients; and

5 a client tree storing the path to each of the clients, such that the server can
6 send data to any client, either directly or through other clients on the network.

1 20. The server of claim 19, further comprising a monitoring logic to
2 monitor a network, the monitoring logic using the client tree to generate a map
3 of the network of clients.

1 21. A method of generating a routing path for a system including a
2 server and a plurality of clients, the method comprising each client:
3 receiving a beacon from the server;
4 rebroadcasting one beacon received from an upstream node; and
5 broadcasting a reverse beacon upstream, the reverse beacon being
6 addressed to the known upstream node, the reverse beacon used by the server
7 and each client to set up a routing table.

1 22. The method of claim 21, wherein a routing table in a particular
2 client includes a default gateway and a path to each client downstream from the
3 particular client.

1 23. The method of claim 21, further comprising the server broadcasting
2 a dummy reverse beacon to initiate the reverse beacon cycle.

1 24. The method of claim 21, further comprising each client aggregating
2 the reverse beacons received from downstream clients, and sending a single
3 reverse beacon including the aggregated information.

1 25. The method of claim 21, wherein receiving a reverse beacon
2 broadcast by a client's default gateway triggers the client to start a timer to send
3 the reverse beacon.

1 26. The method of claim 21, further comprising, if a client receives
2 multiple beacons:
3 evaluating a link quality of each of the beacons received; and
4 selecting the default gateway based on the beacon with the best link
5 quality and rebroadcasting that beacon.

1 27. The method of claim 26, wherein the link quality comprises
2 reliability of the beacon.

1 28. The method of claim 26, wherein the link quality includes
2 information about the back end bandwidth capacity of the server.

1 29. The method of claim 26, wherein the link quality includes
2 information about the traffic being handled by the server.

1 30. The method of claim 21, wherein a connection between the server
2 and the client is a wireless connection.

1 31. The method of claim 21, wherein a connection between the server
2 and the client is chosen from among the following types of connections: a
3 wireless connection, a wired connection, and a switched connection.

1 32. The method of claim 21, further comprising the client:
2 receiving a plurality of beacons from a plurality of servers; and
3 selecting one of the plurality of beacons, and setting the server associated
4 with the selected beacon as its preferred server;
5 thereby self-selecting to belong in a cluster associated with the preferred
6 server.

1 33. The method of claim 32, further comprising the client:
2 moving outside the cluster;
3 upon receiving a beacon from a new cluster, the client setting the server
4 associated with the new beacon and the new cluster as its preferred server.

1 34. The method of claim 33, further comprising:
2 expiring a routing table including a previous preferred server and
3 previous default gateway.

1 35. A routed wireless network comprising:
2 a plurality of wired access points;
3 a plurality of clients, each client belonging to a cluster of clients
4 administered by a single server and such that membership in a cluster is elected
5 by the client through the selection of a beacon to rebroadcast.

1 36. The network of claim 35, wherein the membership in the cluster
2 may change as a result of a client roaming from one region to another within the
3 network.

1 37. The network of claim 35, wherein the membership in the cluster
2 may change as a result of the addition of a new server to the network.

1 38. The network of claim 35, wherein the new server may be a client
2 that is converted into a server by adding a wired connection.

1 39. The network of claim 35, wherein the membership in the cluster
2 may change as a result of the server selected by the client failing to provide
3 adequate service.